

CLAIMS

What is claimed is:

1. An aircraft comprising:

a fuselage defining a central storage cavity having a length of at least 100 feet, a height of at least 16 feet and a width of about 24 feet;

a wing assembly extending through and fixedly coupled to the fuselage in an unswept manner and providing the aircraft with a wingspan of at least 300 feet, the wing assembly defining a pair of wing storage cavities each of which being located on an opposite side of the fuselage, the wing assembly having a moderate aspect ratio of at least 3.5 to permit the aircraft to be flown efficiently in and out of ground effect;

an altitude control system for controlling the altitude of the aircraft when the aircraft is flown in ground effect, wherein the altitude control system is operable in an active mode for maintaining an altitude of the aircraft at about a predetermined altitude above a surface over which the aircraft is traveling; and

a plurality of independent and steerable landing gear coupled to the fuselage and operatively distributing the weight of the aircraft over a predetermined area;

wherein the central storage cavity and the wing storage cavities are configured to receive a cargo that includes intermodal re-usable cargo containers.

2. The aircraft of Claim 1, wherein the wingspan is greater than about 100 feet.

3. The aircraft of Claim 2, wherein the wingspan is greater than about 200 feet.

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4. The aircraft of Claim 1, wherein the wing assembly droops downwardly from the fuselage.

5. The aircraft of Claim 4, wherein the wing assembly includes a wing body and a pair of wing tips, the wing body being fixedly coupled to the fuselage, the wing tips being movably coupled to the opposite ends of the wing body and movable between an extended position, wherein the wing body and each of the wing tips are positioned in a generally horizontally aligned relation, and a retracted position.

6. The aircraft of Claim 5, wherein the wing tips are hingedly coupled to the wing body.

7. The aircraft of Claim 1, wherein at least a portion of the aircraft is configured with an anti-suck down shape.

8. The aircraft of Claim 7, wherein the wing assembly is configured with a substantially flat-bottomed airfoil.

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9. The aircraft of Claim 7, wherein the wing assembly is configured with a droop wing dihedral wherein a tip portion of each of each end of the wing assembly effectively limits the aircraft from being lowered to an altitude that is within a suck-down altitude.

10. The aircraft of Claim 7, wherein the fuselage includes a fuselage nose that is drooped in side view such that the curvature on the underside of an underside of the fuselage nose is limited.

11. The aircraft of Claim 10, wherein the fuselage nose tapers more in plan view than in side view to limit flow acceleration on the underside of the fuselage nose.

12. The aircraft of Claim 7, wherein the fuselage includes an aft fuselage portion that is configured with a limited upsweep to thereby limit flow acceleration.

13. The aircraft of Claim 7, wherein the fuselage includes a necked-down portion that is configured to limit an area of the fuselage that is subject to a suck-down effect.

14. The aircraft of Claim 1, further comprising a plurality of wing-mounted drive units, each of the drive units including a propeller cluster.

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15. The aircraft of Claim 14, wherein each propeller cluster includes a first propeller that is rotatable in a first rotational direction and a second propeller that is rotatable in a second rotational direction opposite the first rotational direction.

16. The aircraft of Claim 14, wherein each propeller cluster includes a plurality of co-axial propellers and each drive unit includes at least one clutch mechanism, the at least one clutch mechanism being operable for selectively coupling at least one of the co-axial propellers to a source of rotational power.

17. The aircraft of Claim 16, wherein each drive unit includes a plurality of engines that are combined into a single nacelle.

18. The aircraft of Claim 14, wherein each propeller cluster includes a plurality of co-axial propellers and each drive unit includes a gearbox, a plurality of engines and at least one clutch mechanism, the gearbox including an input portion and an output portion, the input portion being configured to receive a rotational input from each of the engines, the output portion being configured to output a rotational output to each of the propellers, the clutch mechanism being operable for selectively coupling at least one of the engines to the input portion of the gearbox.

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19. The aircraft of Claim 18, wherein the clutch mechanism is operable in a first mode, wherein only a first one of the engines is coupled to the input portion, a second mode, wherein only a second one of the engines is coupled to the input portion, and a third mode, wherein both of the engines are coupled to the input portion.

20. The aircraft of Claim 1, wherein the fuselage includes a pressurized cockpit.

21. The aircraft of Claim 1, wherein the plurality of independently steerable landing gear are distributed over substantially the entire length of the central storage cavity.

22. The aircraft of Claim 1, wherein each of the plurality of independently steerable landing gear are steerable through an angle of about 360 degrees.

23. The aircraft of Claim 1, wherein the fuselage includes a nose portion and a fuselage body, the nose portion being hingedly coupled to the fuselage body.

24. The aircraft of Claim 1, further comprising a transport system that is fixedly coupled to the fuselage and including a conveyor portion, the conveyor portion of the transport mechanism being configured to facilitate loading and unloading of cargo into the central storage and wing cavities.

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25. The aircraft of Claim 1, wherein the fuselage includes an aft T-tail.
26. The aircraft of Claim 1, wherein the wing assemblies have an aspect ratio of about 6.0.
27. The aircraft of Claim 1, wherein the wing assembly includes a wingbox structure that extends through the fuselage, the wingbox structure including a pair of vertically spaced-apart wing panels, the wing panels intersecting the central storage cavity and cooperating with an associated pair of floor structures to segregate the central storage cavity into an upper fuselage storage cavity and a lower fuselage storage cavity.
28. The aircraft of Claim 27, wherein at least a portion of the wingbox structure that is disposed within the central storage cavity does not include a vertical shear web that connects the wing panels.

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